# An epidemiological and knowledge, attitudes, beliefs and practices study of sexually transmitted infections in older men

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## ABSTRACT

**Introduction: This study was conducted to determine the disease patterns of sexually transmitted infections (STI) in older men, as well as to gather information on their knowledge, attitudes, beliefs and sexual practices.**

**Methods: A prospective study was carried out from January to June 2005 in men aged 50 years or older who attended the Department of STI Control clinic.**

**Results: There were 104 men enrolled. The majority (92.3 percent) were Chinese, and 62.5 percent were aged between 50 and 59 years, 25.9 percent between 60 and 69 years, and 11.5 percent aged 70 years or older. The patients were predominantly heterosexual, and had fairly low levels of education – 85.6 percent of the patients had received primary or secondary school level of education. Majority (79.8 percent) of the men had been sexually active in the preceding six months, and 37.3 percent had paid sex during that time. 29.8 percent of men reported having taken drugs such as sildenafil (Viagra, Pfizer, New York, NY, USA) or similar drugs such as vardenafil (Levitra, Bayer, Wuppertal, Germany) or tadalafil (Cialis, Eli Lilly, Indianapolis, IN, USA). 56.7 percent of the men had active infections, with non-gonococcal urethritis (15.4 percent), genital warts (12.5 percent) and gonorrhoea (10.6 percent) being the commonest. Generally, condom usage was accepted as an effective way to prevent transmission of STI. However, many of the men surveyed felt that condom usage reduced their sexual pleasure, and 38.5 percent felt that condoms were inconvenient. There were also areas of human immunodeficiency virus (HIV) knowledge that were lacking. Most patients listed the media as their main source of knowledge about STI and HIV.**

**Conclusion: Older males attending the clinic remain at significant risk of STI and targeted educational efforts are warranted.**


**Keywords: condom, epidemiology, genital warts, gonorrhoea, non-gonococcal urethritis, sexually transmitted diseases**

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## INTRODUCTION

Sexually transmitted infections (STI) in persons older than 50 years are rarely studied because STI are more common in young people. There is little published data focusing on this group of patients which is relevant to Singapore, as older people are not traditionally considered at risk for STI. A previous study on STI in persons older than 50 years in Singapore showed that out of 17,734 STI notifications between 1996 and 2000, persons aged 50 years and older accounted for 7.6% (2,179) of all notifications[1]. This represents a small but significant proportion of the total STI burden.

With better standards of healthcare, people are living longer and healthier lives, and can remain sexually active well into advanced ages. A better understanding of the epidemiology as well as the sexual knowledge, attitudes, beliefs and practices of the older patient is important for reducing STI morbidity and improving STI care. The aims of this study were: (1) to determine the disease patterns of STI in men (aged 50 years or older) who attend the Department of STI Control (DSC) clinic in Singapore; and (2) to gather information on the knowledge, sexual practices and attitudes of the older person attending the clinic with regard to STI.

## METHODS

A prospective study was carried out in the DSC clinic over a six-month period, from January to June 2005. Inclusion criteria were any male person aged 50 years or older at the time of registration at the DSC clinic. This study focused on men for two

reasons, namely: the previous study by Tan et al showed that the older male accounted for 82.3% of all STI notifications in persons aged 50 years or older, and male patients account for the majority of patients attending the DSC clinic[1].

The study was approved by the ethics committee of the hospital, and by the institutional review board. Any man aged 50 years or older attending the DSC clinic was approached to participate in the study. They were asked to fill in a questionnaire that was administered by a health adviser. This questionnaire was conducted on a one-to-one basis in a private counselling room. It was administered together with any other relevant counselling which the patient had to undergo, e.g. pre-human immunodeficiency virus (HIV) test counselling. After explaining the study, reading the information sheet to the subject, ensuring that he had understood the study and answering any questions he had, verbal consent was obtained to enrol him in the study. Participants were aware that the information they provided would be used for a study, but were assured of confidentiality as only aggregate data would be used, and there were no identifying features on the questionnaire after they had answered it.

Demographical data was obtained, along with disease data and information with regard to possible source of infection, basic knowledge about HIV/STI, attitudes toward use of condoms and safer sex practices. Chi-square test was used to determine statistical significance.

## RESULTS

There were 123 men who were eligible for the study. 104 men agreed to be enrolled in the study, giving a response rate of 84.6%. The demographics of the patients are shown in Table I. There were 32 patients (30.8%) aged 50-54 years, 33 patients (31.7%) aged 55-59 years, 23 patients (22.1%) aged 60-64 years, four patients (3.8%) aged 65-69 years, and 12 patients (11.5%) aged 70 years or older.

The majority (96/104, 92.3%) of the patients were Chinese. There were also three (2.9%) Malay and five (4.8%) Indian patients. Almost all the patients seen (102/104, 98.1%) were Singaporean citizens, with two others being Malaysians. Most of the patients (72.1%) were married, with 10.6% being single. The others were separated (1%), divorced (8.7%) or widowed (7.7%). Buddhism was the most common religion. A quarter (26%) of the patients surveyed were retired.

Almost all the patients had attained at least a primary school level of education. Only five patients

**Table I. Demographics of the study group.**

| | Number of patients | % |
|---|---|---|
| **Age (years)** | | |
| 50-54 | 32 | 30.8 |
| 55-59 | 33 | 31.7 |
| 60-64 | 23 | 22.1 |
| 65-69 | 4 | 3.8 |
| ≥70 | 12 | 11.5 |
| **Race** | | |
| Chinese | 96 | 92.3 |
| Malay | 3 | 2.9 |
| Indian | 5 | 4.8 |
| **Religion** | | |
| Buddhism | 62 | 59.6 |
| Christianity | 17 | 16.3 |
| Hinduism | 1 | 1 |
| Islam | 3 | 2.9 |
| None | 18 | 17.3 |
| Others | 3 | 2.9 |
| **Marital status** | | |
| Married | 75 | 72.1 |
| Single | 11 | 10.6 |
| Separated | 1 | 1 |
| Divorced | 9 | 8.7 |
| Widowed | 8 | 7.7 |
| **Occupation** | | |
| Administrative/ management | 5 | 4.8 |
| Technician | 6 | 5.8 |
| Sales and service | 7 | 6.7 |
| Clerical | 3 | 2.9 |
| Production operator | 5 | 4.8 |
| Construction worker | 1 | 1 |
| Labourer | 7 | 6.7 |
| Military | 1 | 1 |
| Self-employed | 15 | 14.4 |
| Unemployed | 5 | 4.8 |
| Retired | 27 | 26 |
| Others* | 22 | 21.2 |
| **Educational level** | | |
| None | 5 | 4.8 |
| Primary | 36 | 34.6 |
| Secondary | 48 | 46.2 |
| Polytechnic/junior college | 9 | 8.7 |
| University | 4 | 3.8 |
| Postgraduate | 2 | 1.9 |

* Odd-job, security guard, carpark attendant, delivery man, taxi driver, bouncer, hawker assistant, cleaner, car wash attendant, petrol attendant.

(4.8%) reported no formal education. 34.6% had primary school education, 46.2% had secondary school education, 8.7% had polytechnic or junior college qualifications, and 5.7% of patients had tertiary level education. The main language spoken and written was Mandarin (48.5%), followed by English (41.7%).

The older men surveyed were predominantly heterosexual (101/104, 97.1%), with two reporting themselves as bisexual, and one person identifying himself as homosexual. The age at sexual debut, first partner and number of lifetime partners of the men surveyed are shown in Table II. 76% of the men surveyed had lost their virginity before they reached the age of 25 years. Most of them (74.1%) were between 15 and 24 years old when they had sex for the first time, with only two patients (1.9%) reporting their sexual debut at age 14 years or younger. By the time they were 39 years old, 99% of the men surveyed had had sex.

**Table II. Age at sexual debut, first partner and lifetime partners.**

| | % of patients |
|---|---|
| **Age at first sexual experience (years)** | |
| <14 | 1.9 |
| 15-19 | 33.7 |
| 20-24 | 40.4 |
| 25-29 | 17.3 |
| 30-34 | 3.8 |
| 35-39 | 1.9 |
| 40-44 | 1 |
| Unknown/not answered | 3.8 |
| **First partner** | |
| Steady partner | 18.3 |
| Wife | 28.8 |
| Casual partner | 8.7 |
| Commercial sex worker | 44.3 |
| **Number of lifetime sexual partners** | |
| Unknown/not answered | 3.8 |
| 1 | 5.8 |
| 2-4 | 23.1 |
| 5-7 | 6.7 |
| 8-10 | 4.8 |
| >10 | 55.8 |

46 men (44.3%) reported commercial sex workers as the first person they had sex with, another 28.8% reported wives, 18.3% a steady partner, and 8.7% a casual partner. The number of lifetime sexual partners among those who have had sex ranged from one to more than ten. 80% of patients aged 65 years or older reported more than ten lifetime sexual partners, compared to 40% in those aged 50-54 years old, 57.6% in those aged 55-59 years old, and 68.2% in those aged 60-64 years old. Patients aged 65 years or older were statistically more likely to report a high number of sexual partners (ten or more) than their counterparts in the 50-54 years age range (p=0.017).

83 (79.8%) of the patients have had sex in the preceding six months. There were no statistical differences between the various age groups. Among those who were married, 36.6% reported that they were not sexually active with their wives in the past six months, 25.8% had sex with their wives once a month or less, 28% two to four times a month, and 6.5% were having sex with their spouse five or more times monthly. 31 patients (37.3%) have had paid commercial sex in the past six months. The locations were Singapore (16/31), Indonesia (11/31), Thailand (2/31) and China and Malaysia (one each). 43.5% of patients surveyed had experienced oral sex before, with only one person having had anal sex.

29.8% of patients reported having taken sildenafil (Viagra®, Pfizer, New York, NY, USA) or other similar drugs such as vardenafil (Levitra®, Bayer, Wuppertal, Germany) or tadalafil (Cialis®, Eli Lilly, Indianapolis, IN, USA). Most patients reported taking the medication infrequently (less than once a month), with five patients taking the medication two to four times a month, and two patients taking it five or more times per month. In terms of traditional/non-pharmaceutical sources to boost sexual activity, only one person reported taking "*Tongkat Ali*", while four had taken traditional Chinese medicinal herbs. None of the patients interviewed had taken products such as animal penises or used medicated sprays or oils to prolong their erections.

Out of the 104 patients seen, 59 (56.7%) had active infections. 35.6% of the patients seen were not detected to have any infection and had attended the clinic for the purpose of an STI screen. The three most common diseases were non-gonococcal urethritis (NGU) (16 cases, 15.4%), genital warts (13 cases, 12.5%), and gonorrhoea (11 cases, 10.6%). There were nine patients with syphilis, and another nine with genital herpes. The remaining eight patients had other problems such as genital dermatoses (psoriasis, lichen planus, fixed drug eruptions) (four cases), balanoposthitis (three cases), and squamous cell carcinoma of the penis (one case).

Patients were asked questions regarding condom usage. Of the 73 respondents who had had sex with a regular partner in the previous six months, 11%

**Table III. Responses to STI/HIV questionnaire.**

| Statement | True | False | Unsure |
|---|---|---|---|
| All STIs can be cured. | 48.1% | 36.5% | 15.1% |
| A person can have HIV and still look well. | 72.1% | 10.6% | 17.3% |
| Condoms can prevent STI and HIV. | 89.4% | 4.8% | 5.8% |
| **Transmission of HIV possible through** | | | |
| Vaginal sex without condom use | 95.2% | 1.9% | 2.9% |
| Oral sex without condom use | 83.7% | 6.7% | 9.6% |
| Anal sex without condom use | 87.5% | 3.8% | 8.7% |
| Sharing needles and syringes | 96.2% | 2.9% | 0.9% |
| Infected mother to baby | 91.3% | 3.8% | 4.9% |
| Eating together with infected person | 25.0% | 66.3% | 8.7% |
| Sharing toilets with infected person | 22.1% | 68.3% | 9.6% |
| Kissing an infected person | 53.8% | 37.5% | 8.7% |
| Being coughed and sneezed at | 29.8% | 57.7% | 12.5% |

indicated that they used a condom every time, 32.8% used them occasionally and 56.2% did not use condoms. There were 78 persons who had had sex with other partners in the past six months (these included commercial sex workers and casual contacts). A higher proportion (34.6%) indicated that they used a condom every time with someone who was not their regular partner. 41% used condoms occasionally, and 24.4% did not use condoms at all.

The main reason for using condoms on every occasion for those who had sex with a regular partner was to avoid pregnancy (three out of eight responses, 37.5%), whereas for those who had had sex with someone other than their regular partners, all (27/27, 100%) stated that the main motivation was to avoid acquisition or transmission of STI.

91 (87.5%) patients had ever used condoms in the past. Problems reported with condom usage were condom breakage, slippage and the inability to perform sexually when condoms were used. Of the patients surveyed, 5.8% reported the problem of condom breakage and 10.6% reported the problem of condom slippage. There were no statistically significant differences between the various age groups with regard to these problems. The most commonly-reported problem with the use of condoms was that it affected sexual performance. Overall, 22.1% of patients reported this. There was no statistically significant difference between the various age groups with regard to this problem.

All 104 patients were surveyed regarding their attitudes toward condom use. 88.5% felt that condoms were an effective way to prevent transmission of STI, while 7.7% felt that they were ineffective. There were no statistically significant differences detected across the various age groups. 38.5% thought that condoms were inconvenient, while 73.1% felt that the use of condoms would reduce sexual pleasure.

Participants in the survey were asked to answer "true", "false" or "unsure" to the following statements:

1. "All STIs can be cured."
2. "A person can have HIV and still look well."
3. "Condoms can prevent STI and HIV."
4. "HIV can be transmitted through vaginal sex without condom use."
5. "HIV can be transmitted through oral sex without condom use."
6. "HIV can be transmitted through anal sex without condom use."
7. "HIV can be transmitted by sharing needles and syringes."
8. "HIV can be transmitted from infected mother to baby."
9. "You can get HIV by eating together with an infected person."
10. "You can get HIV by sharing toilets with an infected person."
11. "You can get HIV by kissing an infected person."
12. "You can get HIV by being coughed and sneezed at."

The responses are summarised in Table III. There were no statistically significant differences between the various age groups. Table IV shows the main sources of information about the DSC clinic and STI/HIV.

**Table IV. Sources of information about DSC and STI/HIV.**

| Source | Information about DSC | Information about STI/HIV |
|---|---|---|
| Friend | 23.1% | 36.5% |
| Newspapers | 8.7% | 69.2% |
| TV/radio | 4.8% | 50.0% |
| Magazines | 1.0% | 26.0% |
| Doctor | 43.3% | 9.6% |
| Posters | 1.0% | 9.6% |
| Internet | 1.0% | 5.8% |
| DSC website | 2.9% | 3.8% |
| Others | 21.2% | 6.7% |

## DISCUSSION

A previous study had shown that STI in older persons accounted for 7.6% of all notifications between 1996 to 2000[1]. The three most common infections in the older population were gonorrhoea, syphilis and genital herpes, with NGU also being common in the older male. It was also found that amongst older persons diagnosed with STI, there was a higher male predominance than that seen among younger males, a finding that was also observed in an American study of STI in older persons in Washington State, USA[2].

This study focusing on the older male patient attending a public STI clinic shows that more than half (56.7%) of the men surveyed had active infections, with NGU, warts and gonorrhoea being the three most common infections. Syphilis and genital herpes were also prevalent. There were no cases of HIV infection detected. About a third of patients had come to the clinic for STI screening, and there were several cases of patients attending for a genital dermatosis, such as psoriasis or lichen planus.

The older patient, particularly the older male, is thus at significant risk for infection. Traditionally, older people have not been considered at risk for STI, but there are several factors that put them at risk. With increased lifespan and better quality of life due to advancements in healthcare, it is not surprising that men and women continue to have sex in their older years[3]. A study on 319 individuals aged over 50 years conducted in Sheffield in the United Kingdom found that approximately 80% of respondents were currently sexually active and 7% engaged in behaviours that could place them at risk of contracting a STI[4]. Risk-takers were typically male, aged between 50 and 60 years, and married, and being male was also related to reporting current or past sexual health concerns.

The present study shows similar findings; the majority of the patients studied (62.5%) were between 50 to 60 years old, and 72.1% were married. Patients in this study were mostly Chinese, and had mainly primary or secondary school level of education. The main language spoken was Mandarin. The patients in our survey were almost exclusively heterosexual (97.1%). Most of them (76%) had experienced sex before they reached the age of 25.

Risk-taking behaviour in this group is significant. 44% of them reported commercial sex workers as the first person they had sex with. At the time of the survey, 79.8% of the men had had sex within the preceding six months, and 37.3% had had paid commercial sex during that time. This finding indicates the need to target the older population in STI/AIDS prevention messages as well.

In the light of newly available medications for erectile dysfunction, patients were asked if they had taken any such medications or aphrodisiacs. A significant proportion (29.8%) had taken drugs such as sildenafil (Viagra®, Pfizer, New York, NY, USA), vardenafil (Levitra®, Bayer, Wuppertal, Germany) or tadalafil (Cialis®, Eli Lilly, Indianapolis, IN, USA). There were only five patients who admitted to taking traditional aphrodisiacs, with one taking "*Tongkat Ali*", a traditional Malay herb to boost sexual activity and four others having taken traditional chinese herbs. None of the men surveyed had taken products such as tigers' penises, which are banned in Singapore.

With the advent of effective pharmacotherapy for erectile dysfunction, the risk of STI is a possible consequence, especially in the older population. While we found that a high proportion of the men in our survey had taken these medications, we were unable to draw any conclusions regarding their use and possible link to STI, as the numbers in our study were small. A recent paper in the urology literature found a rising trend in heterosexual transmission of HIV and gonorrhoea in older men aged over 50 years in the USA, paralleled by a large increase in the number of sildenafil prescriptions in the last few years. The authors admitted that there could be multiple contributory factors for their findings, but the trend was worth noting[5].

Usage of condoms among the older men surveyed varied, depending on who their sexual partners were. Among the 73 men who had had sex with a regular partner in the previous six months, 11% indicated that they used a condom every time, while 56.2% did not use condoms. The use of condoms here was mainly to avoid pregnancy. Among those who had sex with a different partner (including commercial sex workers and

casual sexual contacts), a higher proportion (34.6%) indicated that they used a condom every time, with 41% using condoms occasionally. Here, the only reason for consistent condom use was to reduce the risk of acquisition or transmission of an STI.

Generally, condom usage was accepted as an effective way to prevent transmission of STI. However, many of the men surveyed felt that condom usage reduced their sexual pleasure, and 38.5% felt that condoms were inconvenient. These attitudes are not surprising, and are common among STI clinic patients. Other studies have also found that significant beliefs about condom use included decreased feeling, worry about breakage, decreased pleasure for the partner, discomfort, and inconvenience[6]. These findings indicate the need to incorporate attitudes and normative beliefs to change condom-use behaviour in the older sexually-active population.

The older patient's knowledge about STI/HIV can be improved. While knowledge about possible ways to transmit HIV, such as unprotected intercourse, maternal transmission and sharing of needles, was good (correct answers ranging from 83.7% to 95.2% of responses), half of those surveyed (53.8%) felt that kissing an infected person could transmit HIV, and 22.1% to 29.8% of respondents wrongly believed that they could contract HIV from activities such as eating together with an infected person, sharing toilets, and being coughed and sneezed at.

The media plays an important role in providing information about STI/HIV in general. 69% of the patients surveyed listed the newspapers as a source of information, with another 50% listing the television/ radio as another source. Most of the older patients were made aware of the DSC clinic mainly from their doctors (43.3%). Future campaigns could address this issue, with the public being reminded that a facility for specialised STI care exists in Singapore.

There have been several studies addressing the problem of HIV infection in older persons[7-10]. Studies in the United Kingdom show that numbers of older individuals newly diagnosed with HIV have increased in recent years[11]. However, there is a dearth of studies addressing the problem of STI in the older individual. More studies need to be done, as acquisition of STI would place these persons at risk of HIV infection as well.

In conclusion, this study addresses some of the important issues regarding the knowledge, practices and risk behaviour of older men attending the DSC clinic in Singapore. While these patients represent a higher-risk group, the appropriate agencies should proceed to conduct a more general population-based survey on older persons. The need for targeted campaigns at predominantly Mandarin-speaking, lower-educated males is especially pressing.

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